

AMENDED SET OF CLAIMS

1. (Currently Amended) A heat absorb-release plastic resin composition comprising

i) ~~a matrix resin material selected from the group consisting of polybutylene terephthalate, polyethylene terephthalate, aromatic polyamide, polyamide, polycarbonate, polystyrene, polyphenylene sulfide, thermal emitting liquid crystal polymer, polysulfone, polyether sulfone, polyether imide, polyether ether ketone, polyacrylate, polymethyl methacrylate, polyvinylalcohol, polypropylene, polyethylene, polyacrylonitrile-butadiene-styrene copolymer, polytetramethyleneoxide-1,4-butandiol copolymer (polybutylene terephthalate elastic body), a styrene containing copolymer, fluorine-based resin, polyvinylchloride, polyacrylonitrile, and a mixture thereof, and~~

ii) a phase transition material that has lower fusion-crystallization temperature than the matrix resin and has 10J/g or more of heat absorb or heat release amount at a lower temperature than a fusion temperature of the matrix resin, ~~iii) a compatibilizer selected from the group consisting of maleic anhydride olefin copolymer, vinylacetate olefin copolymer, polyolefin copolymerized with amide group, styrene-ethylene-butadiene-styrene copolymer, styrene-butadiene-styrene copolymer, and a mixture thereof, and~~

~~iv) a thermally conductive solid additive selected from the group consisting of copper, silver, gold, steel, nickel, silicon carbide, silicon, boron~~

~~nitride, boron azenide, boron phosphide, diamond, beryllium oxide, beryllium sulfide, aluminum nitride, aluminum phosphide, gallium nitride, gallium phosphide, and a mixture thereof in an amount of 5 to 90 parts by weight, based on 100 parts by weight of the sum of said matrix resin material and said phase transition material,~~

~~wherein, the ratio by weight of said matrix resin material and phase transition material ranges from 60:40 to 80:20, and said heat absorb-release plastic resin composition satisfies the requirements of Flexural Modulus being 3000Kg/cm² or more, and room temperature heat conductivity being 0.4 W/m-K or more.~~

~~said heat absorb-release plastic resin composition satisfying one of the following requirements:~~

- ~~a) Flexural Modulus being 3000 Kg/cm² or more,~~
- ~~b) room temperature heat conductivity being 0.4 W/m-K or more, and~~
- ~~c) Flexural Modulus being 3000Kg/cm² or more, and room temperature heat conductivity being 0.4 W/m-K or more.~~

2. (Original) The heat absorb-release plastic resin composition according to claim 1, wherein the resin composition has thermal conductivity satisfying the following Equation 1, when contacts with a liquid phase medium:

[Equation 1]

$$\left(\frac{hd}{k}\right) < 1$$

wherein, h is heat transfer coefficient (W/m²K) of the composition, d is a thickness of the composition, and k is thermal conductivity(W/m-K) of the composition.

3. (Original) The heat absorb-release plastic resin composition according to claim 2, wherein the resin composition has heat conductivity satisfying the following Equation 2, when contacts with a liquid phase medium:

[Equation 2]

$$\left(\frac{hd}{k}\right) < 0.1$$

wherein, h is heat transfer coefficient (W/m²K) of the composition, d is a thickness of the composition, and k is thermal conductivity(W/m-K) of the composition.

4. (Original) The heat absorb-release plastic resin composition according to claim 1, wherein the resin composition has heat conductivity satisfying the following Equation 3, when contacts with a solid phase medium:

[Equation 3]

$$\frac{d}{k} < \frac{d_a}{k_a}$$

wherein, d is a thickness (m) of the composition, k is thermal conductivity (W/m-K) of the composition, and d_a and k_a respectively are thickness and thermal conductivity of material contacted with the composition.

5-6. (Cancelled).

7. (Currently Amended) The heat absorb-release plastic resin composition according to claim 1, wherein the phase transition material is selected from the group consisting of zeolite powder, calcium bichloride, crystalline paraffin wax, polytriphenyl phosphate, polyethyleneglycol, fatty acid, naphthalene, polyepsilon caprolactone, polyethylene oxide, polyisobutylene, polycyclopentene, polycyclooctene, ~~polycyclododecen~~ polycyclododecene, polyisoprene, polyoxytriethylene, ~~polyoxytetramethylene~~ polyoxytetramethylene, polyoxyoctamethylene, polyoxypropylene, polybutyrolactone, polyvalerolactone, polyethyleneadipate, polyethylene suberate, polydecamethylazellate, and a mixture thereof.

8-11. (Cancelled).

12. (Currently Amended) The heat absorb-release plastic resin

composition according to claim 1, further comprising a ~~reforecing~~ reinforcing additive selected from the group consisting of glass fiber, carbon fiber, talc, glass flake, mica, carbon black, carbon nanotube, and a mixture thereof, in an amount of 1 to 30 parts by weight, based on 100 parts by weight of the sum of the a) matrix material and the b) phase transition material.

13. (Currently Amended) A molded product prepared from the heat absorb-release plastic resin composition of claim 1 5.

14. (Original) The molded product according to claim 13, wherein the resin composition has thermal conductivity satisfying the following Equation 1, when contacts with a liquid phase medium:

[Equation 1]

$$\left(\frac{hd}{k} \right) < 1$$

wherein, h is heat transfer coefficient (W/m²K) of the composition, d is a thickness (m) of the composition, and k is thermal conductivity (W/m-K) of the composition.

15. (Original) The molded product according to claim 13, wherein the resin composition has thermal conductivity satisfying the following Equation 3, when contacts with a solid phase medium:

[Equation 3]

$$\frac{d}{k} < \frac{d_a}{k_a}$$

wherein, d is a thickness (m) of the composition, k is thermal conductivity (W/m-K) of the composition, and d_a and k_a respectively are thickness and thermal conductivity of material contacted with the composition.

16. (Cancelled).

17. (Currently Amended) The molded product according to claim 13, wherein the phase change material is selected from the group consisting of zeolite powder, calcium bichloride, ~~crystalline~~ crystalline paraffin wax, polytriphenylphosphate, polyethyleneglycol, fatty acid, naphthalene, polyepsiloncaprolactone, polyethyleneoxide, polyisobutylene, polycyclopentene, polycyclooctene, polycyclododecene, polyisoprene, polyoxytriethylene, polyoxytetramethylene, polyoxyoctamethylene, polyoxypropylene, polybutyrolactone, polyvalerolactone, polyethylenedipate, polyethylene suberate, polydecamethyl azelate, and a mixture thereof.

18-19. (Cancelled)

20. (Original) The molded product according to claim 13, further

comprising a reinforcing additive selected from the group consisting of glass fiber, carbon fiber, talc, glass flake, mica, carbon black, carbon nanotube, and a mixture thereof, in an amount of 1 to 30 parts by weight, based on 100 parts by weight of the sum of the a) matrix resin material and the b) phase change material.

21. (New) A heat absorb-release plastic resin composition comprising:

i) a matrix resin material selected from the group consisting of polybutylene terephthalate, polyethylene terephthalate, aromatic polyamide, polyamide, polycarbonate, polystyrene, polyphenylene sulfide, thermal emitting liquid crystal polymer, polysulfone, polyether sulfone, polyether imide, polyether ether ketone, polyarylate, polymethyl methacrylate, polyvinylalcohol, polyacrylonitrile-butadiene-styrene copolymer, polytetramethyleneoxide-1,4-butandiol copolymer (polybutylene terephthalate elastic body), a styrene containing copolymer, fluorine-based resin, polyvinylchloride, polyacrylonitrile, and a mixture thereof, and

ii) a phase transition material that has lower fusion-crystallization temperature than the matrix resin and has 10J/g or more of heat absorb or heat release amount at a lower temperature than a fusion temperature of the matrix resin,

wherein, the ratio by weight of said matrix resin material and phase transition material ranges from 60:40 to 80:20, and said heat absorb-release

plastic resin composition satisfies one of the following requirements:

- a) Flexural Modulus being 3000 Kg/cm² or more,
- b) room temperature heat conductivity being 0.4 W/m-K or more, and
- c) Flexural Modulus being 3000Kg/cm² or more, and room temperature heat conductivity being 0.4 W/m-K or more.

22. (New) A heat absorb-release plastic resin composition comprising:

i) a matrix resin material selected from the group consisting of polybutylene terephthalate, polyethylene terephthalate, aromatic polyamide, polyamide, polycarbonate, polystyrene, polyphenylene sulfide, thermal emitting liquid crystal polymer, polysulfone, polyether sulfone, polyether imide, polyether ether ketone, polyarylate, polymethyl methacrylate, polyvinylalcohol, polypropylene, polyethylene, polyacrylonitrile-butadiene-styrene copolymer, polytetramethyleneoxide-1,4-butandiol copolymer (polybutylene terephthalate elastic body), a styrene containing copolymer, fluorine-based resin, polyvinylchloride, polyacrylonitrile, and a mixture thereof,

ii) a phase transition material that has lower fusion-crystallization temperature than the matrix resin and has 10J/g or more of heat absorb or heat release amount at a lower temperature than a fusion temperature of the matrix resin,

iii) a compatibilizer selected from the group consisting of maleic anhydride olefin copolymer, vinylacetate olefin copolymer, polyolefin

copolymerized with amide group, styrene-ethylene-butadiene-styrene copolymer, styrene-butadiene-styrene copolymer, and a mixture thereof, and

iv) a reinforcing additive selected from the group consisting of glass fiber, carbon fiber, talc, glass flake, mica, carbon black, carbon nanotube, and a mixture thereof, in an amount of 1 to 30 parts by weight, based on 100 parts by weight of the sum of said i) matrix material and said ii) phase transition material,

wherein, the ratio by weight of said matrix resin material and phase transition material ranges from 60:40 to 80:20, and said heat absorb-release plastic resin composition satisfies the requirements of Flexural Modulus being 3000 Kg/cm² or more.